

CLAIMS:

What is claimed is:

- 1 1. A method of enabling use of a secure password,
2 comprising:
3 during power up initialization before an operating
4 system is started, copying security data from a memory
5 device to a restricted portion of system memory which is
6 invisible to the operating system; and
7 before starting the operating system, hard locking the
8 memory device against direct access so that a reset signal
9 is required to unlock the memory device.
- 1 2. The method of claim 1, further comprising:
2 responsive to receiving an entered password under the
3 operating system, calling a routine executing within the
4 restricted portion of system memory to verify the password;
5 and
6 receiving an indication from the routine regarding
7 whether the entered password matched a password within the
8 security data copied to the restricted portion of system
9 memory from the memory device.
- 1 3. The method of claim 1, wherein the step of copying
2 security data from a memory device to a restricted portion
3 of system memory which is invisible to the operating system
4 further comprises:
5 checking a return address for a call requesting that
6 the security data be copied to verify that the call
7 originated with a trusted routine.
- 1 4. The method of claim 3, wherein the step of checking a

2 return address for a call requesting that the security data
3 be copied to verify that the call originated with a trusted
4 routine further comprises:

5 placing a label within a basic input/output services
6 routine implementing a process for copying the security data
7 immediately after instructions for the call requesting that
8 the security data be copied;

9 placing an address for the label within code executing
10 within the restricted portion of system memory and checking
11 the return address for the call requesting that the security
12 data be copied;

13 comparing the return address and the address for the
14 label;

15 responsive to determining that the return address does
16 not match the address for the label, returning a null
17 response to the call requesting that the security data be
18 copied; and

19 responsive to determining that the return address
20 matches the address for the label, copying the security data
21 to the restricted portion of system memory and resetting a
22 retry counter.

1 5. The method of claim 1, wherein the step of copying
2 security data from a memory device to a restricted portion
3 of system memory which is invisible to the operating system
4 further comprises:

5 copying the password and other sensitive data which
6 requires protection from access under the operating system.

1 6. The method of claim 1, wherein the step of copying
2 security data from a memory device to a restricted portion
3 of system memory which is invisible to the operating system

4 further comprises:
5 loading the security data to regular system memory
6 prior to initiating the call requesting that the security
7 data be copied; and
8 upon receiving any response to the call requesting that
9 the security data be copied, erasing the security data from
10 regular system memory before starting the operating system.

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 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1 7. A method of enabling use of a secure password,
2 comprising:

3 responsive to receiving an entered password under an
4 operating system, calling a routine executing within a
5 restricted portion of system memory to verify the password,
6 wherein the restricted portion of system memory is invisible
7 to the operating system and wherein the operating system and
8 routines executing within the restricted portion of system
9 memory communicate through a calling convention; and

10 receiving only an indication from the routine executing
11 within the restricted portion of memory regarding whether
12 the entered password matched a password stored within the
13 restricted portion of system memory.

1 8. The method of claim 7, further comprising:

2 during power up initialization before the operating
3 system is started, copying a password from a memory device
4 to the restricted portion of system memory; and

5 before starting the operating system, hard locking the
6 memory device against direct access so that a reset signal
7 is required to unlock the memory device.

1 9. The method of claim 7, further comprising:

2 determining whether a password is required for an
3 operation by checking with the routine executing within a
4 restricted portion of system memory to verify existence of a
5 password.

1 10. The method of claim 7, further comprising:

2 limiting a number of retries for a user to reenter a
3 password.

11. The method of claim 7, further comprising:
transmitting the entered password entered by a user to the routine executing within a restricted portion of system memory using the calling convention; and
responsive to receiving an indication from the routine executing within the restricted portion of memory that the entered password matched the password stored within the restricted portion of system memory, continuing an operation requiring the entered password for execution.

12. A data processing system, comprising:

a memory device which may be hard locked against direct access so that a reset signal is required to unlock the memory device; and

a power up initialization routine executing within the data processing system,

wherein the power up initialization routine, before starting an operating system, copies security data from the memory device to a restricted portion of system memory which is invisible to the operating system and hard locks the memory device.

13. The data processing system of claim 12, wherein the power up initialization routine, responsive to receiving an entered password under the operating system, calls a routine executing within the restricted portion of system memory to verify the password and receives an indication from the routine regarding whether the entered password matched a password within the security data copied to the restricted portion of system memory from the memory device.

14. The data processing system of claim 13, wherein the routine executing within the restricted portion of system memory checks a return address for a call requesting that the security data be copied to verify that the call originated with a trusted routine.

15. The data processing system of claim 13, wherein the power up initialization routine, to facilitate checking a return address for a call requesting that the security data be copied to verify that the call originated with a trusted routine, places a label within a basic input/output services

6 routine implementing a process for copying the security data
7 immediately after instructions for the call requesting that
8 the security data be copied,

9 wherein the routine executing within the restricted
10 portion of system memory contains an address for the label,
11 checks the return address for the call requesting that the
12 security data be copied, and compares the return address and
13 the address for the label and,

14 responsive to determining that the return address
15 does not match the address for the label, returning a
16 null response to the call requesting that the security
17 data be copied, and

18 responsive to determining that the return address
19 matches the address for the label, copying the security
20 data to the restricted portion of system memory and
21 resetting a retry counter.

1 16. The data processing system of claim 12, wherein the
2 power up initialization routine copies the password and
3 other sensitive data which requires protection from access
4 under the operating system.

1 17. The data processing system of claim 12, wherein the
2 power up initialization routine loads the security data to
3 regular system memory prior to initiating the call
4 requesting that the security data be copied and, upon
5 receiving any response to the call requesting that the
6 security data be copied, erases the security data from
7 regular system memory before starting the operating system.

1 18. A data processing system, comprising:
2 an operating system;
3 a memory device which may be hard locked against direct
4 access so that a reset signal is required to unlock the
5 memory device;
6 a system memory including a restricted portion
7 invisible to the operating system, wherein the operating
8 system and routines executing within the restricted portion
9 of system memory communicate through a calling convention;
10 and
11 a power up initialization routine executing within the
12 data processing system, wherein the power up initialization
13 routine, responsive to receiving an entered password under
14 an operating system, calls a routine executing within a
15 restricted portion of system memory to verify the password,
16 and receives only an indication from the routine executing
17 within the restricted portion of memory regarding whether
18 the entered password matched a password stored within the
19 restricted portion of system memory.

1 19. The data processing system of claim 18, wherein the
2 power up initialization routine, during power up
3 initialization before the operating system is started,
4 copies a password from the memory device to the restricted
5 portion of system memory and, before starting the operating
6 system, hard locks the memory device against direct access
7 so that a reset signal is required to unlock the memory
8 device.

1 20. The data processing system of claim 18, wherein the
2 power up initialization routine determines whether a
3 password is required for an operation by checking with the

4 routine executing within a restricted portion of system
5 memory to verify existence of a password.

1 21. The data processing system of claim 18, wherein the
2 routine executing within a restricted portion of system
3 memory to verify the password limits a number of retries for
4 a user to reenter a password.

1 22. The data processing system of claim 18, wherein the
2 power up initialization routine transmits the entered
3 password entered by a user to the routine executing within a
4 restricted portion of system memory using the calling
5 convention and, responsive to receiving an indication from
6 the routine executing within the restricted portion of
7 memory that the entered password matched the password stored
8 within the restricted portion of system memory, continues an
9 operation requiring the entered password for execution.

1 23. A computer program product within a computer usable
2 medium for enabling use of a secure password, comprising:
3 instructions for copying security data from a memory
4 device to a restricted portion of system memory which is
5 invisible to the operating system during power up
6 initialization before an operating system is started; and
7 instructions for hard locking the memory device against
8 direct access so that a reset signal is required to unlock
9 the memory device before starting the operating system.

1 24. The computer program product of claim 23, further
2 comprising:
3 instructions, responsive to receiving an entered
4 password under the operating system, for calling a routine
5 executing within the restricted portion of system memory to
6 verify the password; and
7 instructions for receiving an indication from the
8 routine regarding whether the entered password matched a
9 password within the security data copied to the restricted
10 portion of system memory from the memory device.

1 25. The computer program product of claim 23, wherein the
2 instructions for copying security data from a memory device
3 to a restricted portion of system memory which is invisible
4 to the operating system further comprise:
5 instructions for checking a return address for a call
6 requesting that the security data be copied to verify that
7 the call originated with a trusted routine.

1 26. The computer program product of claim 25, wherein the
2 instructions for checking a return address for a call
3 requesting that the security data be copied to verify that

4 the call originated with a trusted routine further comprise:
5 instructions for placing a label within a basic
6 input/output services routine implementing a process for
7 copying the security data immediately after instructions for
8 the call requesting that the security data be copied;

9 an address for the label within code executing within
10 the restricted portion of system memory and checking the
11 return address for the call requesting that the security
12 data be copied;

13 instructions for comparing the return address and the
14 address for the label;

15 instructions, responsive to determining that the return
16 address does not match the address for the label, for
17 returning a null response to the call requesting that the
18 security data be copied; and

19 instructions, responsive to determining that the return
20 address matches the address for the label, for copying the
21 security data to the restricted portion of system memory and
22 resetting a retry counter.

1 27. The computer program product of claim 23, wherein the
2 instructions for copying security data from a memory device
3 to a restricted portion of system memory which is invisible
4 to the operating system further comprise:

5 instructions for copying the password and other
6 sensitive data which requires protection from access under
7 the operating system.

1 28. The computer program product of claim 23, wherein the
2 instructions for copying security data from a memory device
3 to a restricted portion of system memory which is invisible
4 to the operating system further comprise:

5 instructions for loading the security data to regular
6 system memory prior to initiating the call requesting that
7 the security data be copied; and

8 instructions for erasing the security data from regular
9 system memory before starting the operating system upon
10 receiving any response to the call requesting that the
11 security data be copied.

1 29. A computer program product within a computer usable
2 medium for enabling use of a secure password, comprising:
3 instructions, responsive to receiving an entered
4 password under an operating system, for calling a routine
5 executing within a restricted portion of system memory to
6 verify the password, wherein the restricted portion of
7 system memory is invisible to the operating system and
8 wherein the operating system and routines executing within
9 the restricted portion of system memory communicate through
10 a calling convention; and

11 instructions for receiving only an indication from the
12 routine executing within the restricted portion of memory
13 regarding whether the entered password matched a password
14 stored within the restricted portion of system memory.

1 30. The computer program product of claim 29, further
2 comprising:

3 instructions for copying a password from a memory
4 device to the restricted portion of system memory during
5 power up initialization before the operating system is
6 started; and

7 instructions for hard locking the memory device against
8 direct access so that a reset signal is required to unlock
9 the memory device before starting the operating system.

1 31. The computer program product of claim 29, further
2 comprising:

3 instructions for determining whether a password is
4 required for an operation by checking with the routine
5 executing within a restricted portion of system memory to
6 verify existence of a password.

1 32. The computer program product of claim 29, further
2 comprising:

3 instructions for limiting a number of retries for a
4 user to reenter a password.

1 33. The computer program product of claim 29, further
2 comprising:

3 instructions for transmitting the entered password
4 entered by a user to the routine executing within a
5 restricted portion of system memory using the calling
6 convention; and

7 instructions, responsive to receiving an indication
8 from the routine executing within the restricted portion of
9 memory that the entered password matched the password stored
10 within the restricted portion of system memory, for
11 continuing an operation requiring the entered password for
12 execution.